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ABSTRACT

This paper discusses the definition of learning disability through the concept of early identification of vulnerable children, based on a study of 650 inner-city preschool children. While the study's first step, scanning, identified the children who were vulnerable to learning disability, the second step, diagnosis, attempted to find the reasons for their vulnerability. Scanning was done with a 20 minute individual test (SEARCH) consisting of 10 components: three in visual perception, two in auditory perception, two in intermodal skills, and three in body image. The heterogeneity of the children found to be vulnerable to learning disability is described. While all of these children demonstrated a common immaturity in spatial orientation and temporal organization, clinical examinations were necessary to tease out the origins of this immaturity in terms of biological, cognitive, emotional, and experiential factors. This heterogeneity is not only important in planning the nature, timing, and intensity of intervention, but also in the interpretation of generalizations drawn from research in which the learning disabled group is treated as if it were homogeneous. (Author/DLS)

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This paper was prepared for presentation at a symposium "Measurement and Definition of Learning Disability" at the Annual Meeting of the American Educational Research Association, April 7, 1980 in Boston, Massachusetts.

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Clinical Models of Learning Disability in a Study of Intact Groups of Six-Year-Olds*

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This paper will approach the definition of learning disability through the concept of early identification of vulnerable children. Our data are drawn from intact groups of children all born in 1971 who were scanned as part of the on-going school-based preventive projects operated by the Learning Disorders Unit of the Department of Psychiatry of New York University Medical Center in cooperation with Community School District II, Manhattan. These are clinical data collected in the naturalistic setting of seven inner-city schools. Scanning procedures involve every child enrolled in order to avoid the economic, sexual, and social biases that referral procedures may introduce.

Setting and Procedures

The Learning Disorders Unit is a multidisciplinary group with both service and research responsibilities. Since 1969 the Unit has operated school-based projects to locate children vulnerable to learning failure, to provide interdisciplinary clinical diagnosis, and to intervene educationally before failure has occurred. Our preventive program was a demonstration model funded by the Bureau of Education for the Handicapped from 1976 to 1979. It was submitted to the Joint

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Dissemination Review Panel of U.S. Office of Education and the National Institute of Education in 1979 where it was approved on the basis of data concerning educational impact, replicability, and cost effectiveness. It is now part of the National Diffusion Network.

The core of this program is a scanning test SEARCH (which is administered to all children in participating schools before they enter first grade) and TEACH (a program of learning activities designed to mesh with the educational needs of vulnerable children as revealed by scanning and diagnosis. (Silver & Hagin, 1975; Hagin, Silver, & Kreeger, 1976)

Our criteria for vulnerability were drawn from the clinical features that we have found distinguish children with learning disability from children with other clinical problems: basic immaturity with respect to the child's age and intelligence in aspects of the neurological, psychological, and perceptual examination dealing with spatial orientation and temporal organization. Clinical surveys have described these findings in detail (Silver & Hagin, 1960) and follow-up studies of children from the clinical sample have traced the pervasive influence of temporal and spatial immaturities on aspects of perception and language and on personality development. (Silver & Hagin, 1964)

When we moved from the clinic into our first school-based project in 1969, we found that the clinical criteria could be applied with the intact first grade sample from a

regular public school. (Hagin & Silver, 1972) These criteria correctly predicted for 98% of the children later found to have learning disabilities. In a sample of 168 children, there was one false positive (i.e. a child who, on examination was found to have the neuropsychological signs described above, but who was succeeding in learning on follow-up in third grade) and nine false negatives (i.e. children who did not learn effectively although they had not demonstrated the clinical findings described above). Of this group of nine, two children were found to have emotional problems reactive to family disorganization. The remaining seven were bi-lingual children whose abstract language abilities were not equal to the conceptual demands of the reading comprehension test given in third grade.

Having surveyed the incidence and variety of problems in the natural setting of the school, the Learning Disorders Unit began what has become a long-term commitment to prevention through early identification, diagnosis, and intervention with learning disabilities. With wider dissemination of preventive programs, we found we could not continue to enjoy the luxury of intensive clinical study of all children. Our solution to meet the dilemma of cost, on one hand, and the need to preserve the cues for intervention available from intensive clinical study on the other, was to plan a two-step process: scanning and diagnosis.

The first step is to locate children who are vulnerable to learning failure. This is done by means of a twenty-minute individual test SEARCH. (Silver, Hagin, & Beecher, 1978)

This test consists of ten components: three in visual perception (discrimination, recall, and visual-motor), two in auditory perception (discrimination and sequencing), two in intermodal skills (articulation and sound-symbol association), and three in body image (directionality, finger schema, and pencil grip). The ten components are utilized as a total SEARCH score to delineate vulnerability and as individual scores to yield a profile of assets and deficits to guide educational intervention.

While the first step, scanning, identifies the children who are vulnerable, the second step, diagnosis, attempts to find the reasons for their vulnerability,

The multidisciplinary clinical studies consist of neuropsychiatric, psychological examination, and developmental history from parents and school and hospital records. Diagnostic procedures, including ratings for the neurological and psychiatric examination and diagnostic use of the Wechsler Preschool and Primary Scale of Intelligence have been described in previous publications. (Silver & Hagin, 1972; Hagin, Silver & Corwin, 1972; Hagin & Silver, 1977)

Results

Within the framework described above, let us focus on one group of children BD 1971, all the children who had been enrolled in kindergarten or entered early in first grade in seven schools (P.S. 2, 26, 116, 130, 151,126 and 198) located in the lower east side or midtown Manhattan. A total of 650 children were scanned with SEARCH by September,1977.

There were slightly more boys (52%) than girls (48%) in the group. The ethnic census for these schools showed that there were 11.5% Black, 36% Oriental, 34% Hispanic, and 18.5% Other, including Caucasian children, enrolled. In our BD 1971 sample, thirteen children were found to have insufficient English for valid testing and were dropped from this sample. Otherwise, the group scanned represented the intact enrollment of beginning first graders of the seven schools.

There were 192 or 29.5% of the group scanned who were found to be vulnerable to learning disability. Of these, 103 (54%) were boys and 89 (46%) were girls. These proportions closely approximate the sex distribution in the total group.

By the end of first grade the effects of mobility could be seen in our sample. Of our original group, 494 or 76% remained enrolled in the seven project schools. As is often the case, the children most in need of services are also the most mobile. By the end of first grade, 124 (64%) of the children originally identified as vulnerable remained enrolled in the project schools. The percentage of vulnerability (124 out of 494) becomes 25.4% with sex distribution relatively the same (60% boys 40% girls). The ethnic distribution in the vulnerable group closely paralleled the ethnic distribution of the seven schools: 9% Black, 30% Oriental, 41% Hispanic, 20% Other. On the Wechsler Preschool and Primary Scale of Intelligence Full Scale IQ scores ranged

from 61 to 124, with a mean of 93.39 ± 12.43.

Diagnostic study enabled us to identify a number of subgroups within the sample of vulnerable children:

Children with Specific Language Disabilities

These children demonstrated the basic problems with spatial orientation and temporal organization, evidence that cerebral dominance for language had not been firmly established, and immaturity in body image and right-left discrimination. Psychological study showed that they possessed adequate experiential background for school learning. No evidence of structural defect of the central nervous system or of the peripheral sensory apparatus was seen on neuropsychiatric examination or in the children's developmental histories. However, they had difficulty with associative learning tasks such as the association of sounds with their written symbols and with the Animal-House subtest of the WPPSI. The origin of this kind of learning disability may be familial, (i.e. the child's inherited pattern of development is one in which language specialization develops more slowly than other brain functions). In the BD 1971 group, 83 or 17% of the children were diagnosed as specific language disabilities. Proportions of boys and girls were not significantly different, with 58% and 42% respectively diagnosed as specific language disabilities.

Children with Organic Findings

These children present the common characteristics of spatial and temporal problems but, in addition, have deviations in one or more of the areas of the neurological examination, including muscle tone, power, and synergy; gross and fine motor coordination; cranial nerve function; maintenance of posture and equilibrium; deep, superficial, and pathological reflexes. Even within this subgroup, much variation was seen. Rarely do findings point to focal brain damage and rarely can specific causal factors be found in their histories. These youngsters do find learning difficult because of their poor impulse control, their difficulties in sustaining attention, their awkward motor control, and their predisposition to anxiety. Children with organic findings numbered 23 or 5% of the BD 1971 group. Of these 23 youngsters, 16 were boys and 7 were girls, a proportion significantly different from the expected equal distribution of boys and girls seen in other subgroups.

Children with Developmental Immaturities

A small group of children presented non-specific learning problems characterized by generalized immaturity. With them there was no clinical or historical evidence of structural defect of the central nervous system, but there was slowness reported in their reaching of developmental landmarks. The uniformly low curve of maturation was apparent in their physical appearance.

They were found to be small in size. In gross and fine motor development, in language, and in social awareness, they appeared to be younger than their chronological ages. Although these children function below average on psychological study, we did not find indications of any currently described syndrome of mental retardation. Three children (0.6% of the total sample) comprise this group.

Children with Emotional Problems

Within the total sample there were six children (five boys and one girl) who demonstrated emotional problems serious enough to impair learning. Some of these children were reacting to pathological conditions within the family and the resulting disruption in the home. Others presented severe neurotic and behavior problems reflected in every aspect of their lives, including school learning.

Not included in the subgroups of vulnerable children were a small number of children:

2 children for whom diagnoses were deferred until mild hearing losses could be evaluated and, if necessary, treated

2 children, newly arrived in this country, culturally different youngsters, for whom scanning and diagnostic measures were regarded as inappropriate

5 children identified as vulnerable on scanning, who proved to be normal learners on diagnosis. (This represents a 1% rate of false positives on our prediction measure; the rate of false negatives was found at the end-of-the-year achievement testing to be 8.5%.)

Discussion:

We have been fortunate in having the opportunity to study in their natural setting intact groups of young children as they began their academic work at school. We have learned to identify those who were vulnerable to learning failure before they failed. The distress caused at times by the high mobility rate in some of our samples was more than balanced by the data we obtained on sex ratios.

In 1969 when we first noticed the equal numbers of boys and girls in the vulnerable groups, we thought it was an artifact. Everyone assured us that learning disability is six-, seven-, or ten-times more frequent in boys than in girls. Yet we continued to find relatively equal numbers of boys and girls in our samples of vulnerable six year olds. BD 1971 is not unlike BD 1963 or 1964 in this respect. There is, however, one diagnostic subgroup in which the boy-girl ratio appears to be significantly different: the group with organic findings. Pediatric studies of newborns may shed some light on this finding. In general, such studies

show that male babies tend to be larger and more vulnerable physically. It may be, therefore, that they are also more at risk for neurological insult at birth.

On the other hand, the reasons for the discordant referral rates of boys and girls are not clear from our data. It is,however, tempting to speculate on the impact of parental expectations for boys, or male abrasiveness vs. teacher irritability, or differential coping styles among boys and girls.

As for the original problem of the definition of learning disability, the concept of immaturity in spatial orientation and temporal organization is offered as an attempt to unify the diverse symptoms that have been described. With intact groups of six-year-olds, a scanning measure based on this concept correctly predicted learning disability with 1% false positives and 8.5% false negatives.

Diagnostic studies have shown that, even at this early age, the children thus identified are not a homogeneous group. It is this multidimensionality that invites confusion, frustration and failure of replication in research on learning disabilities. One cannot assume that the defects associated with learning failure in one child are the same as those in any other child who fails to learn. In reality, within the group of children designated as learning disabilities, there are marked individual differences in functioning and in assets and deficits. The importance of these variations is that, in any study of large numbers of children, these

individual differences may cancel each other out. This balancing effect may cause an investigator to dismiss as unimportant some variables that may be crucial to some of the children in the sample.

While the complexity of learning disabilities makes multidimensional study advisable, the developmental nature of the condition gives strong support for a longitudional approach as well. The ability of the human organism to mature and to compensate for functions that have lagged behind the child's general development may produce misleading conclusions when one depends upon cross-sectional data alone.

For example, Satz et al. (1978) found that neuroperceptual deficits identified in kindergarten predicted reading achievement at the end of second grade, despite the fact that in his tests the deficits had largely been overcome by that age. Satz found that, while perceptual deficits were more characteristic of learning disabled children when they were young, difficulty with language skills was more characteristic of the same children when they reached the upper elementary grades.

Other studies using multivariate approaches have shown the complexities in predicting and diagnosing learning disabilities.(Bell & Aftanas, 1972; Jansky & De Hirsch, 1972) The investigator is frequently left with a list of characteristics which may be assoicated with learning disabilities in some children, but may

not be present in other children. Which variables are significant may depend upon the age of the children, the compensatory resources (cognitive, emotional, motivational) and the environmental supports available to them. It is the responsibility of investigators to utilize these often diffuse data to build coherent theories of learning disabilities to account for the phenomena their research may have highlighted.

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